

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY (Chapter I of the Patent Cooperation Treaty)

(PCT Rule 44bis)

Applicant's or agent's file reference PCT2078UWlc	FOR FURTHER ACTION		See item 4 below
International application No. PCT/EP2004/004980	International filing date (<i>day/month/year</i>) 10 May 2004 (10.05.2004)	Priority date (<i>day/month/year</i>) 09 May 2003 (09.05.2003)]	
International Patent Classification (IPC) or national classification and IPC ⁷ H04R 3/00			
Applicant HARMAN BECKER AUTOMOTIVE SYSTEMS GMBH			

1.	This international preliminary report on patentability (Chapter I) is issued by the International Bureau on behalf of the International Searching Authority under Rule 44 <i>bis</i> .1(a).																								
2.	This REPORT consists of a total of 8 sheets, including this cover sheet. In the attached sheets, any reference to the written opinion of the International Searching Authority should be read as a reference to the international preliminary report on patentability (Chapter I) instead.																								
3.	<p>This report contains indications relating to the following items:</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 10%; text-align: center;"><input checked="" type="checkbox"/></td> <td style="width: 30%;">Box No. I</td> <td style="width: 60%;">Basis of the report</td> </tr> <tr> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td>Box No. II</td> <td>Priority</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td>Box No. III</td> <td>Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td>Box No. IV</td> <td>Lack of unity of invention</td> </tr> <tr> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td>Box No. V</td> <td>Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</td> </tr> <tr> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td>Box No. VI</td> <td>Certain documents cited</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td>Box No. VII</td> <td>Certain defects in the international application</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td>Box No. VIII</td> <td>Certain observations on the international application</td> </tr> </table>	<input checked="" type="checkbox"/>	Box No. I	Basis of the report	<input checked="" type="checkbox"/>	Box No. II	Priority	<input type="checkbox"/>	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability	<input type="checkbox"/>	Box No. IV	Lack of unity of invention	<input checked="" type="checkbox"/>	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement	<input checked="" type="checkbox"/>	Box No. VI	Certain documents cited	<input type="checkbox"/>	Box No. VII	Certain defects in the international application	<input type="checkbox"/>	Box No. VIII	Certain observations on the international application
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<input type="checkbox"/>	Box No. VIII	Certain observations on the international application																							
4.	The International Bureau will communicate this report to designated Offices in accordance with Rules 44bis.3(c) and 93bis.1 but not, except where the applicant makes an express request under Article 23(2), before the expiration of 30 months from the priority date (Rule 44bis .2).																								

<p style="text-align: center;">The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland</p> <p>Facsimile No. +41 22 740 14 35</p>	<p>Date of issuance of this report 11 November 2005 (11.11.2005)</p> <p>Authorized officer Yolaine Cussac</p> <p>Telephone No. +41 22 338 70 80</p>
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PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

REC'D 04 NOV 2004

PCT

To:

WIPO

PCT

see form PCT/ISA/220

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY (PCT Rule 43bis.1)

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No.
PCT/EP2004/004980

International filing date (day/month/year)
10.05.2004

Priority date (day/month/year)
09.05.2003

International Patent Classification (IPC) or both national classification and IPC
H04R3/00

Applicant
HARMAN BECKER AUTOMOTIVE SYSTEMS GMBH

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☒ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☒ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1b/s(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA:



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**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/EP2004/004980

Box No. I Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
 - ☐ This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
 - a. type of material:
 - ☐ a sequence listing
 - ☐ table(s) related to the sequence listing
 - b. format of material:
 - ☐ in written format
 - ☐ in computer readable form
 - c. time of filing/furnishing:
 - ☐ contained in the international application as filed.
 - ☐ filed together with the international application in computer readable form.
 - ☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/EP2004/004980

Box No. II Priority

1. ☒ The following document has not been furnished:

- ☒ copy of the earlier application whose priority has been claimed (Rule 43*bis*.1 and 66.7(a)).
☐ translation of the earlier application whose priority has been claimed (Rule 43*bis*.1 and 66.7(b)).

Consequently it has not been possible to consider the validity of the priority claim. This opinion has nevertheless been established on the assumption that the relevant date is the claimed priority date.

2. ☐ This opinion has been established as if no priority had been claimed due to the fact that the priority claim has been found invalid (Rules 43*bis*.1 and 64.1). Thus for the purposes of this opinion, the international filing date indicated above is considered to be the relevant date.
3. Additional observations, if necessary:

Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	1-20
	No: Claims	
Inventive step (IS)	Yes: Claims	
	No: Claims	1-20
Industrial applicability (IA)	Yes: Claims	1-20
	No: Claims	

2. Citations and explanations

see separate sheet

Box No. VI Certain documents cited

1. Certain published documents (Rules 43*bis*.1 and 70.10)
and / or
2. Non-written disclosures (Rules 43*bis*.1 and 70.9)
see form 210

Re Item V.

- 1 The following documents are referred to in this communication:

D1 : EP 1 116 961 A (NOKIA MOBILE PHONES LTD) 18 July 2001 (2001-07-18)
D2 : PATENT ABSTRACTS OF JAPAN vol. 1995, no. 10, 30 November 1995 (1995-11-30) &; JP 7 176178 A (ALPINE ELECTRON INC), 14 July 1995 (1995-07-14)
D3 : GB 2 097 121 A (FERRANTI LTD) 27 October 1982
D4 : US 2003072461 A (MOORER JAMES) 17 April 2003

2 **INDEPENDENT CLAIM 1**

The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of the independent **method claim 1** does not involve an inventive step in the sense of Article 33(3) PCT.

The independent **method claim 1** describes "a method for enhancing communication in a noisy environment comprising: receiving input signals emanating from at least two microphone arrays each comprising at least two microphones and processing the input signals of each microphone array by a beamformer to determine temporal and spatial information about the input signals of each microphone array".

The problem to be solved by the present invention may therefore be regarded as how to improve the flexibility of systems and the signal-to-noise ratio compared to systems comprising single microphones installed in a vicinity of potential speakers.

Document D1, which is considered to represent the most relevant state of the art, discloses a method and system for tracking human speakers using a plurality of acoustic sensors arranged in an array and a beamformer with multiple predetermined beams (see Abstr., §0003, §0004, Fig. 1, claims 1 and 2) to detect the voice of the speakers within an angular range in order to determine a most favourable direction for detecting the voice. The subject-matter of claim 1 differs from D1 in that it involves at least two microphone arrays and corresponding beamformers.

It is however generally known to the person skilled in the art that the usage of multiple microphone arrays (see D1 Col. 4 L54-59) in combination with corresponding

beamformers (see for example page 1 L5-17 and Fig. 1 of D3 or Fig. 9, §0007, claim 35 of D4) is an equivalent to the solution described in the document D1 and can be interchanged where circumstances make it desirable.

3 DEPENDENT CLAIMS 2-13

The subject-matter of dependent **method claims 2-13** does not involve an inventive step in the sense of Article 33(3) PCT.

Claims 2 - 11 are disclosed by D1 (regarding to the section 2 of the present communication which states, that a communication system comprising beamformer forming multiple predetermined beams is generally equivalent to a system comprising at least two microphone arrays with corresponding beamformers).

- **Claim 2** (see Fig.1, Col. 9 L10-15, §0013 and §0016)
- **Claim 3** (see §0028)
- **Claim 4** (see Col. 3 L27-29, Col. 8 L16-24)
- **Claim 5** (see Col. 6 L19-23)
- **Claim 6** (see §0032, Col. 7 L28-33, Fig. 4, Claims 3 and 4)
- **Claim 7** (see §0037 and §0038, Claims 1 and 2)
- **Claim 8** (see Col. 1 L49-52, Col. 5 L26-27)
- **Claim 9** (see Col. 8 L9-33)
- **Claim 10** (see Fig. 2, §0026)
- **Claim 11** (see Fig. 2, §0026)

The dependent **claims 12 and 13** relate to a method comprising a selection of at least one output channel out of at least two and a determination of an amplification level for the selected output channel.

The problem to be solved may therefore be regarded as how to deliver a modified output signal only to a preferred output channel.

Both method steps from **the claims 12 and 13** are described in the document D2, which also belongs to the field of enhancing communication and is dealing with intra-vehicular cabin communication system, as providing the same solution to the above mentioned problem. The skilled person would therefore regard it as a normal option to include this steps in the disclosed in D1 method in order to solve the problem posed.

- **Claim 12** (see D2 Abstr. and Fig. 1)
- **Claim 13** (see D2 Abstr. and Fig. 1)

Therefore none of the claims 2-13 involves an inventive step.

4 **INDEPENDENT CLAIMS 14 and 15**

The subject-matter of the independent **claims 14 and 15** does not involve an inventive step in the sense of Article 33(3) PCT.

Claims 14 and 15 relate to a computer program product or a software code which comprise all the steps described in the corresponding method claims 1-11 (for reasoning why they are not inventive see sections 2 and 3 of the present communication).

5 **INDEPENDENT CLAIM 16**

The subject-matter of the independent **system claim 16** does not involve an inventive step in the sense of Article 33(3) PCT.

The independent **system claim 16** is corresponding to independent method claim 1 and additionally comprises following essential features which are also disclosed by the document D1:

- at least one analog/digital converter (see Fig. 3)
- digital signal processing means having an input for receiving the digital microphone signals (see Fig. 3).

Additionally to the mentioned features the described system comprises also at least two output loudspeakers which corresponds to the method step disclosed in claim 12 (see section 3 of the present communication).

Therefore, based also on the argumentation given in section 3, **claim 16** is not inventive.

6 **DEPENDENT CLAIMS 17-20**

The subject-matter of system **claims 17-20** does not involve an inventive step in the sense of Article 33(3) PCT.

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING
AUTHORITY (SEPARATE SHEET)**

International application No.

PCT/EP2004/004980

The combination of the additional features disclosed by **claims 17-19** is corresponding to method steps from the claims 5, 8 and 12 respectively. Therefore (see argumentation given in section 3 of the present communication), they are not inventive.

The dependent **system claim 20** relates to a vehicular cabin comprising a communication system wherein each microphone array and each loudspeaker is associated with a passenger seat.

A vehicular cabin with the same features are disclosed by the documents D1 (see Abstr. of D1) and D2 (see Fig. 1, Abstr. of D2). The skilled person would therefore regard it as a normal design option to include features from the D1 in the D2 or vice versa. Hence, no inventive step is presented in the subject-matter of the **claim 20**.

Olegs Timms